DOCKET NO: 274417US0PCT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF	:
SUSUMU SAISHO, ET AL.	: EXAMINER: ZIMMERMAN, JOHN J.
SERIAL NO: 10/543,150	:
FILED: JULY 25, 2005	: GROUP ART UNIT: 1794
FOR: ALUMINUM BRAZING SHEET	:

APPEAL BRIEF

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

This is an appeal from the Rejection dated December 21, 2009. A Notice of Appeal was timely filed on March 18, 2010.

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is Kobe Steel, Ltd. having an address of 10-26, Wakinohama-cho, 2-chome, Chuo-ku, Hyogo, Japan, 651-8585.

II. RELATED APPEALS AND INTERFERENCES

Appellants, Appellants' legal representative and the assignee are aware of no appeals, interferences, or judicial proceedings which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF THE CLAIMS

Claims 2, 4-5 and 12-13 stand twice rejected and the rejections are herein appealed.

IV. STATUS OF THE AMENDMENTS

A request for continued examination under 37 C.F.R. 1.114 with Amendment and fee was filed December 8, 2009, following final rejection.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

It is preliminarily noted that references in brackets are to page and line number of the specification as filed.

Independent Claim 2 provides an aluminum brazing sheet[page 1, lines 13-15][page 2, lines 19-22] consisting of:

a core material made of an aluminum alloy;

a cladding material cladded on one side of the core material; and

a brazing material laminated on the side of the core material opposite to the cladding material [page 6, lines 21-26];

wherein

a potential of the cladding is lower than a potential of the core [page 2, lines 26-27] and a sacrificial anode effect is obtained [page 6, lines 6-8],

the cladding material is made of an aluminum alloy consisting essentially of [page 2, line 28]

from 0.52 [page 8, Examples 1, 4, 5, 8, 9 and 11] to 0.7 [page 2, line 28] mass% of Mg [page 4, lines 8-15],

0.5 to 1.5 mass% of Si [page 5, lines 4-11],

0.4 to 1.2 mass% of Mn [page 5, lines 14-21], and

0.3 [page 8, Example 7] to 6 mass% of Zn [page 5, line 23],

the remainder being Al and unavoidable impurities, and

the core material consists essentially of: [page 3, lines 21-22]

0.3 to 0.7 mass% of Si, [page 3, lines 21-22]

0.6 to 1.2 mass% of Mn, [page 3, line 22]

0.5 to 1.0 mass% of Cu, [page 3, line 22]

a maximum of 0.3 mass % Mg,

a maximum of 0.2 mass % Ti, and

a maximum of 0.15 mass % Cr, [page 3, lines 23-27]

the remainder being Al and unavoidable impurities.

Dependent Claim 4 describes a brazing sheet wherein the Si content of the cladding material is in a range of 0.6 to 0.9 mass% [page 3, lines 16-17]. Dependent Claim 5 describes a brazing sheet wherein the Mn content of the cladding material is in a range of 0.6 to 1.0 mass% [page 3, lines 19-20].

Dependent Claim 12 describes a brazing sheet wherein the Si content of the cladding material is in a range of 0.6 to 0.9 mass% [page 3, lines 16-17] and the Mn content of the of the cladding material is in a range of 0.6 to 1.0 mass% [page 3, lines 19-20].

Dependent Claims 4, 5 and 12 stand or fall with Claim 2.

Dependent Claim 13 describes a brazing sheet wherein the Zn content of the cladding material is 2.0 to 6.0 mass% [Examples 1-5, 8 and 9 in Table 1 on page 8]. Claim 13 stands alone.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 2, 4-5 and 12-13 stand twice rejected under 35 U.S.C. § 103(a), as being unpatentable over Syslak (WO 02/090031).

VII. ARGUMENT

Rejection under 35 U.S.C. § 103(a), Syslak (WO 02/090031).

Claims 2, 4, 5 and 12

The claimed invention provides an aluminum brazing sheet especially useful for the manufacture of parts of automobile radiators, including the header and the side plate. The claimed brazing sheet consists of an aluminum core, a cladding material on one side of the core and a brazing material laminated on the opposite side. Appellants have determined that a specific combination of compositions of the respective brazing sheet components, as described in Claim 2, provides a brazing sheet having significantly improved pressure adhesion performance while having good corrosion properties. Specifically, the potential of the core material is higher than that of the cladding in order to obtain a sacrificial anode core protection effect on the clad layer. Appellants have provided the following description of the basis for the claimed anode effect (page 5, line 24 to page 6, line 15):

> When an aluminum alloy having a low potential is employed as a core material, the addition of Zn to the cladding material is effective for obtaining the potential of the cladding material lower than that of the core material. The addition of Zn to the cladding material results in lowering the potential thereof, thereby effectively allowing the potential of the cladding material to be lower than that of the core material. In this case, when the added amount of Zn exceeds 6 mass%, the rolling workability is likely to be lowered, which is not preferable.
>
> In order to fully obtain the sacrificial anode effect of cladding material, the potential of the core material must be higher than that of the cladding material. Therefore, the composition of the core material is selected such that the potential thereof is higher than that of the cladding

> material. For example, an Al-0.5Si-0.8Cu-1.2Mn alloy (in mass%) may be employed. Since Mg contained in the core material enhances the strength of the core material, Mg may be added to the core material up to 0.3 mass% up to which the brazeability is not inhibited.

Appellants note that according to the recitation of Claim 2. the core consists essentially of Al, Mg, Si, Mn, Cu, Ti and Cr (in amounts described in Claim 12). **Zinc is not described as a component of the core.** The claimed cladding alloy consists essentially of Al, Mg, Si, Mn, (in amounts according to Claim 12) and 0.3 to 6 mass % Zn. Appellants submit that the claim description therefore requires that the Zn content of the cladding layer is from 0.3 to 6 mass % greater than the Zn content of the core. Furthermore, according to the invention, only unavoidable or contaminant content of Zn may be present in the core to assure the necessary differential in Zn content to obtain the sacrificial anode effect.

In contrast, Syslak describes a brazing sheet for a heat exchanger, with a core material of an aluminum alloy and a brazing aluminum alloy metal clad on at least one side of the core (Claim 1). The core material contains up to 0.6 weight % Zn (Claim 6) or 0.1 to 2 weight % Zn (Claim 7) and the inner clad material contains 1.0 to 2.0 weight % Zn (Claim 9).

Syslak describes corrosion resistance can be attributed to factors such as 1) formation of a sacrificial precipitation band due to diffusion of Si from the braze to the core during brazing; 2) grain elongation; 3) formation of a Cu depletion band at the surface of the brazed materials (page 8, line10 to page 9, line 12) and 4) a concentration gradient of Zn in the core formed during brazing when Zn migrates from the braze clad into the core (page 9, lines13-22). Nowhere does Syslak disclose or suggest a brazing sheet wherein a potential of the cladding is lower than a potential of the core and a sacrificial anode effect is obtained, as described in Claim 2 of the invention.

Appellants note that Syslak describes a sacrificial gradient among various parts of the heat exchanger assembly (page 11, lines 10-19) wherein a fin portion is sacrificed to protect

the tube. Applicants submit that this is not the sacrificial anode effect described in the present invention.

The Office has alleged that the required differential in potential between the clad and the core would be inherent to the Syslak braze sheet, since "Syslak's core and cladding compositions are patentably indistinct from those of the applicant . . ." (Official Action dated December 21, 2009, page 5, lines 8-10).

Appellants disagree and note that comparison of claimed Zn content in Syslak, for example, 2 weight % of Claim 7 in the core to 1-2 weight % Zn in the clad of Claim 9 does not provide the difference described in Claim 2 of the invention and therefore the potential difference cannot be present.

> To establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)(citations omitted)

Appellants submit that a sacrificial anode effect is not inherent to the description of Syslak and therefore the cited reference does not describe all the elements of the claimed invention.

Appellants further note that Syslak requires a Mg content in the cladding as 0.5 weight % (page 5, line 24). In contrast, the claimed invention describes a Mg content as a range of from 0.52 to 0.7 weight %. The Office has alleged that a difference of 0.02 weight % Mg is not significant (Official Action dated December 21, 2009, page 4, lines 6-8) and discounts the difference.

Appellants previously provided the following data (Response to Official Action dated January 27, 2009, filed May 27, 2009) supported by a Declaration under 36 C.F.R. § 1.132, by Mr. Toshiki Ueda, an inventor in this application, to show that significant improvement in

post brazing strength is obtained when the claimed composition is employed. Appellants provided the following Table of data constructed with original data from Table 1 and the data provided in the attached Declaration. In the Table, the Examples are according to the claimed composition with respect to Si, Mn, and Zn. The effect of the claimed composition range for Mg is demonstrated.

Example	Mg (mass %)	Post Brazing Strength (MPa)
10	0.50	163
2	0.50	163
1	0.52	169
8	0.56	167
4	0.59	165
9	0.6	168
11	0.6	169
5	0.7	171

Appellants submit that the above data show that the post-brazing strength of the sheet is improved by more than 3% in a change from 0.50 to 0.52 mass % and therefore a significant improvement is obtained when the Mg content is in the range as claimed in the present invention. Syslak does not disclose or suggest such improvement.

In discussion of "**Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in View of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.***" the Office has stated:

> "The rationale to support a conclusion that the claim would have been obvious is that **all the claimed elements were known in the prior art** and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art at the time of the invention. ""[I]t can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." **If any of these findings cannot be made, then this rationale cannot be used to support a conclusion that the claim would have been obvious to one of ordinary skill in the art,**" (Federal Register, Vol. 72, No. 195, page 57529) (Bold added) (Citations omitted)

Applicants submit that as described above, Syslak does not disclose or suggest a Mg content of 0.52 to 0.7 mass % and does not disclose or suggest a sacrificial anode effect as according to the claimed invention. Therefore, Appellants submit that Syslak does not make all the claimed elements known and according to the KSR guidelines a conclusion of obviousness cannot be supported. Accordingly, Appellants submit that the rejection is in error and must be reversed.

Claim 13

Claim 13 recites that the Zn content of the cladding material is 2.0 to 6.0 mass %. Appellants submit that according to this description the differential in Zn content from the core to the cladding is at least 2 mass %. As described above, Syslak recites a core Zn content of up to 0.6 weight % Zn in Claim 6 and of 0.1 to 2 weight % in Claim 7. In Claim 9, the reference describes a Zn content in the clad layer of 1.0 to 2.0 weight %. Appellants submit that Syslak cannot render the present invention according to Claim 13 obvious for all the above reasons, especially when a Zn differential between the core and clad cannot be 2 mass %. Accordingly, Appellants submit that the rejection must be reversed.

CONCLUSION

For the above reasons, it is respectfully requested that all outstanding rejections of the pending claims be reversed.

Respectfully submitted,

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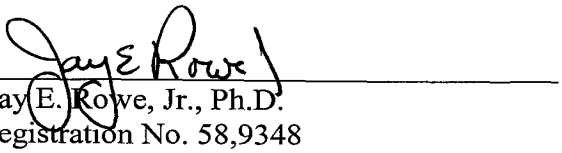
MAIER & NEUSTADT, L.L.P.
Norman F. Oblon



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VIII. CLAIMS APPENDIX

Claim 1 (Canceled).

Claim 2 (Rejected): An aluminum brazing sheet consisting of:

a core material made of an aluminum alloy;

a cladding material cladded on one side of the core material; and

a brazing material laminated on the side of the core material opposite to the cladding material;

wherein

a potential of the cladding is lower than a potential of the core and a sacrificial anode effect is obtained,

the cladding material is made of an aluminum alloy consisting essentially of

from 0.52 to 0.7 mass% of Mg,

0.5 to 1.5 mass% of Si,

0.4 to 1.2 mass% of Mn, and

0.3 to 6 mass% of Zn,

the remainder being Al and unavoidable impurities, and

the core material consists essentially of:

0.3 to 0.7 mass% of Si,

0.6 to 1.2 mass% of Mn,

0.5 to 1.0 mass% of Cu,

a maximum of 0.3 mass % Mg,

a maximum of 0.2 mass % Ti, and

a maximum of 0.15 mass % Cr,

the remainder being Al and unavoidable impurities.

Claim 3 (Canceled).

Claim 4 (Rejected): The aluminum brazing sheet according to claim 2, wherein the Si content of the cladding material is in a range of 0.6 to 0.9 mass%.

Claim 5 (Rejected): The aluminum brazing sheet according to claim 2, wherein the Mn content of the cladding material is in a range of 0.6 to 1.0 mass%.

Claims 6-11 (Canceled).

Claim 12 (Rejected): The aluminum brazing sheet according to claim 4, wherein the Mn content of the aluminum alloy constituting the cladding material is in a range of 0.6 to 1.0 mass%.

Claim 13 (Rejected): The aluminum brazing sheet according to claim 2, wherein the Zn content of the cladding material is 2.0 to 6.0 mass%.

Claims 14-17 (Canceled).

IX. EVIDENCE APPENDIX

Copy of the declaration of Mr. Toshiki Ueda, submitted May 27, 2009, is attached.

X. RELATED PROCEEDINGS APPENDIX

None